DOCUMENT RESUME

ED 316 196 IR 014 186

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TITLE What Happens after ACOT: Outcomes for Program Graduates One-Year Later.
PUB DATE 8 Aug 89
NOTE 92p.; For additional reports on the Memphis ACOT project, see ED 295 600 and ED 308 837.
PUB TYPE Reports - Research/Technical (143)

EDRS PRICE MF01/PC04 Plus Postage.
DESCRIPTORS *Academic Achievement; *Computer Assisted Instruction; Grade 6; Grade 7; *High Risk Students; Intermode Differences; Interviews; Longitudinal Studies; Middle Schools; Minority Group Children; *Parent Attitudes; *Student Attitudes; Surveys; *Teacher Attitudes
IDENTIFIERS *Apple Classrooms of Tomorrow

ABSTRACT

This research examined the impact of the Apple Classrooms of Tomorrow (ACOT) project on seventh grade students in the year following their ACOT participation in sixth grade. Subjects were 24 former ACOT students and 29 matched control students, all of whom had attended sixth grade at the same school. All subjects were minority students representing an academically at-risk population. Research questions concerned the nature of the students' experiences during the post-ACOT school year and differences between the ACOT and control groups on measures of attitude and achievement. The questions were addressed using surveys of and interviews with students, parents, and teachers; a keyboarding skills test; course grades; and California Achievement Test (CAT) scores. Comparisons between groups showed much greater similarities than differences. Where differences were found, however, they consistently favored the ACOT group. Those advantages included: (1) higher fall ratings of social skills by students' English teachers; (2) higher overall fall English ratings; (3) superior fall and spring keyboarding skills; and (4) higher fall and spring mathematics and CAT scores. Parents of students in both groups expressed consistently positive views about computers and their role in education. The absence of stronger differences between ACOT and control students is interpreted as reflecting less about the effectiveness of ACOT than about the difficulty of trying to overcome at-risk students' long-term histories of failure and disadvantaged home environments with relatively short-term interventions. Data are displayed in six tables, and appended materials include the data collection instruments, interview summaries, and teachers' comments. (25 references) (GL)

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What Happens After ACOT: Outcomes for Program Graduates One-Year Later

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What Happens After ACOT:

Outcomes for Program ~~Candidates~~ Graduates One-Year Later

Summary

The present research examined the impact of the Apple Classroom of Tomorrow (ACOT) project on seventh-grade students in the year following their ACOT participation in sixth-grade. Subjects were 24 former ACOT students (96% of the sixth-grade participants) and 29 matched control students all of whom had attended sixth-grade at the same school. All subjects were minority students representing an academically at-risk population. Research questions of interest concerned the nature of students' experiences during the post-ACOT school year and differences between the ACOT and control groups on measures of attitude and achievement. The questions were addressed through data sources consisting of surveys and interviews of students, parents, and teachers; a keyboarding skills test; course grades; and California Achievement Test (CAT) scores.

Comparisons between groups showed much greater similarities than differences. Where differences were found, however, they consistently favored the ACOT group. Those advantages included (a) higher fall ratings of social skills by students' English teachers, (b) higher overall fall-English ratings, (c) superior fall and spring keyboarding skills, and (d) higher fall and spring mathematics CAT scores. Overall, students in both groups were characterized by their English and math teachers as having a difficult year, as reflected by low achievement, poor motivation, and behavior problems. The computer teacher who taught approximately half of the ACOT students at one school described them as superior in keyboarding but "average" in enthusiasm and computer skills. Generally, she did not feel that they were able to transfer many of the computer skills that they had presumably learned the previous year to her more structured computer class.

Parents of students in both groups expressed consistently positive views about computers and their role in education. ACOT parents lamented the discontinuation of ACOT for their children, feeling that the experiences were positive ones that were educationally beneficial. Also frequently mentioned were family members' interest in the home computer, and the value of the distance tutoring activities in providing additional support for the student and stimulating learning at home. Due to the discontinuation of ACOT and the more challenging seventh-grade curriculum, parents generally felt that their children were performing more poorly this year than last. Interviews with students strongly reinforced the impression of a school year of pressures and frustrations. ACOT students greatly missed their computers and the experiences of the ACOT class. Both ACOT and control students found the current year's computer experiences highly limited compared to the previous year.

The absence of stronger differences between ACOT and control students is interpreted as reflecting less about the effectiveness of ACOT than about the difficulty of trying to overcome at-risk students' long-term histories of failure and disadvantaged home environments with relatively short-term interventions (Slavin & Madden, 1988). Based on evaluations of students at the time of their ACOT participation (Baker & Herman, 1989; Kitabchi, 1988), there can be little doubt of the program's success in teaching students to use computers skillfully and enthusiastically as a learning tool. The transferability of the ACOT experience would thus appear to most strongly depend on the availability of computers in the post-ACOT environment. Unfortunately, in the present seventh-grade classes such availability was minimal.

Based on the results, recommendations for future practice are that: (a) a smoother transition from ACOT to conventional classes be provided for students, (2) "reasonable" computer access be made available in the post-ACOT classes, (3) greater emphasis in the ACOT progam be devoted to the integration of computer

activities with the curriculum, particularly the teaching of basic skills, (4) ACOT be started earlier (first or second-grade) and continue for a longer duration, and (5) parental involvement be given greater emphasis. A main implication of Memphis ACOT is that by being able to work with computers, all children, perhaps especially disadvantaged ones, can increase their range of accomplishments while developing skills with modern technological applications valued by society. As they acquire and demonstrate these skills, they can feel positively about themselves, perhaps in ways they have never experienced before. But to remain so "empowered," students must have access to the tools on which their successful performances depend. The experience of having worked with a computer in the past is of doubtful value if there are no computers to work with now.

What Happens After ACOT: Outcomes for Program Graduates One-Year Later

The purpose of this study was to examine the long-term impact of the Apple Classroom of Tomorrow (ACOT) project on participants at the Memphis, Tennessee site. Currently, there is much interest in the influences of the ACOT experience on children's learning, motivation, socialization, and family involvement (e.g., see Kitabchi, 1987; 1988; Ross, Smith, Morrison, & Erickson 1988). Although findings to date regarding ACOT's immediate effects have been generally positive (Kitabchi, 1987; Baker & Herman, 1989), a critical question is how long and to what extent such benefits endure. The present research addressed this issue by examining the school achievement and attitudes of former sixth-grade ACOT students who were attending conventional seventh-grade classes at different schools. The design included comparisons with a matched control group who formerly attended a non-ACOT sixth-grade class at the same school as the ACOT sample, and interviews and surveys with parents and teachers. An additional purpose of the research was to develop methodologies and instrumentation to support broader-based studies that include other ACOT sites and an extended longitudinal time frame.

The basic premise of the proposed study is that a computer-saturated environment can do more than simply provide automated tools to make the immediate learning tasks easier and more enjoyable. Carefully designed and intensive computer learning experiences should help students to develop practical skills for applying advanced technology to learning, increased proficiency at independent learning, stronger knowledge foundations in the basic subjects, and positive self-concepts. These types of benefits obviously acquire special significance for disadvantaged or "at risk" students, such as the target population in Memphis. To the extent that the new skills and attitudes transfer

to future learning situations, program experiences can have a positive impact on students for the remainder of their schooling and into their adult lives. With regard to the ACOT project, critical questions become: (a) What conditions do students encounter when they leave the ACOT environment and enter conventional classrooms, (b) To what extent do skills and attitudes acquired from ACOT experiences transfer to those conventional settings, and (c) Does exposure to the ACOT environment create any unique problems once the student is returned to a conventional setting? The present study was designed to answer these questions and thus take an important initial step in evaluating, and suggesting ways to enhance, ACOT's long-term educational impact.

Theoretical Framework

Much attention in recent years has been given to investigating the effectiveness of computer-assisted instruction (CAI) relative to other methods. Most evidence has been favorable, suggesting that CAI improves both learning and attitudes (e.g., Bracey, 1987; Kulik, Kulik, & Cohen, 1980; Petkovich & Tennyson, 1984). Of importance to the present interests, benefits seem especially likely to occur when CAI is used (a) as a supplement to regular classroom instruction rather than as the primary teaching method, (b) with elementary students, and (c) with low-achievers (Slavin, 1988). However, as Clark (1983, 1985) and others (Hagler & Knowton, 1987; Salomon, 1984) convincingly argue, it is not media per se that affect learning. Rather, it is the instructional strategies that the different media employ. This perspective directly discourages what Papert (1987) criticizes as "technocentric" interpretations of CBI (i.e., viewing the computer as the "effective" agent), in favor of attempts to identify the conditions and strategies with which the computer's special capabilities are maximized (Ross & Morrison 1989; Petkovich & Tennyson, 1984).

Within this framework, the first step in evaluating the ACOT program becomes one of understanding its component educational strategies. In brief, those

strategies include providing, to 13 classrooms in five national sites, computer hardware and software, local coordinators, specially trained teachers, and technical assistance. Each student and teacher in these classrooms receives a computer to use at school and another to use at home, thus allowing for virtually unlimited computer access for working with CAI programs and practicing applications skills such as word-processing. Each site is locally controlled, sets its own goals, and decides where to concentrate its ACOT resources. In the case of the Memphis site, the following special features had particular relevance to the present evaluation:

1. All participants were minority students representing an economically disadvantaged and academically at-risk school population.
2. Training in basic skills and using tool software such as Appleworks was explicitly emphasized in instructional objectives.
3. Parents were integrally involved by being required to attend training sessions and personally pick-up the home computer system.
4. Each student was assigned a personal tutor who was a Master of Arts in Teaching candidate from Memphis State University. The tutor left assignments and wrote messages and feedback over an electronic Bulletin Board System (BBS) accessed by modem.

Not surprisingly, with these powerful interventions, results for the 1985-86 and 1986-87 school years showed the ACOT classes to be superior to non-ACOT classes in basic skills, grade equivalent gain scores, and attitudes toward learning and school activities (Kitabchi, 1987). Results from the 1987-1988 program were less consistent or clear, but still tended to favor ACOT students over controls on several standardized achievement subtests (i.e., math computation, math concepts/applications, and language mechanics) and on attitude measures (Kitabchi, 1988). These results are encouraging, but are such short-term benefits maintained when students leave the program? In the case of

compensatory education programs, such as Operation Head Start, achievement effects are frequently found to fade over time, so that several years following program completion, participants differ only slightly from control students (Hodges & Smith, 1978; Sprigle & Schaefer, 1985). A strong contributing factor appears to be the lack of cognitive stimulation in the economically disadvantaged home to reinforce what is learned in school (Heyns, 1978). Further, as Bransford (1979) indicates, unless children can be helped to develop the skills needed to learn from experiences, exposure to enriched environments may do little good. In view of these interpretations, two distinctive properties of the ACOT program seem important in increasing the likelihood of carryover effects. One is that, through their interest in the program and associated activities, parents become oriented to encourage their children's learning and provide more facilitating home environments. A second is the children's acquisition of new knowledge and attitudes in direct association with the learning of computer skills. Key variables of the non-ACOT classrooms thus become whether strong parental involvement continues and whether students have sufficient opportunities to apply their computer skills to new learning activities. These properties were examined as part of the present research plan. The major research questions addressed were:

1. Do former ACOT participants demonstrate any advantages in the first year after the ACOT experience relative to control students in basic skills, motivation, classroom socialization, and computer skills?
2. How do computer access and associated activities in the conventional classroom compare to those of the ACOT setting?
3. What are parental attitudes concerning their children's experiences in conventional classes as compared to the ACOT environment?
4. Do students maintain the same levels of performance and motivation over the post-ACOT school year?

Method

Subject and Design

The target research sample was the entire population of seventh-graders (n = 25) who participated the previous year (1987-1988) as sixth-graders in the Memphis ACOT program. All ACOT students were initially located, but one moved out of state before the actual study was initiated, yielding a final n of 24. A control group was formed by randomly selecting 30 students who were enrolled in two non-ACOT sixth-grade classes at the same time and at the same school as the ACOT sample. As with the ACOT group, all were initially located, but one moved before the study was begun (n = 29). A total of 16 ACOT students (67%) and 26 (90%) control students attended East High School; the remaining 11 students attended 8 different schools in Memphis. Two control students who left school during the year were included in the fall but not the spring assessments (spring control n = 27).

The control students lived in the same neighborhood as the ACOT students and were considered to be comparable in general abilities, motivation, and home environment prior to the inception of the ACOT project. Participants in ACOT had been selected on a voluntary basis with the restriction that a home phone be available for the child's use in telecommunications. Because selection did not appear to be systematically biased toward higher ability or higher motivation, the ACOT sample was regarded as reasonably representative of the overall population of sixth-graders at the target school. The basic design for the study was quasi-experimental for outcomes on which both the ACOT and control groups were assessed: (a) attitudes (fall and spring); (b) math, English, and computer teacher evaluations (fall and spring); (c) parent surveys (spring); (d) keyboarding skills (fall and spring); and (e) reading and mathematics scores on the California Achievement Test (CAT, fall and spring). Descriptive and

qualitative analysis were also made of interview data collected fom ACOT students, their parents, and their seventh-grade computer teacher.

Instrumentation

Keyboarding test. Students' keyboard speed and accuracy were assessed using the MECC Keyboarding Master program on an Apple IIe computer. All students, including those in the control group, were highly familiar with the operation of the Apple IIe, but none had any prior experience with the particular typing program. Four sentences of differing readability were selected from seventh-grade reading texts. Readability was determined using the RIXRATE readability software package. Sentences were separately presented in order of increasing readability level. For each, the program automatically recorded number of errors and completion time, and computed the average number of words per minute.

Student survey. The student survey contained 17 items to which students reacted using a five-point Likert scale. A copy of the survey is presented in Appendix A. The survey, which was adapted from an instrument developed by Kitabchi (1987; 1988) and used in previous ACOT evaluations, was designed to assess general attitudes toward school and learning, specifically with regard to (a) motivation for learning and achieving (item n =4), (b) locus of control and internal attributions (n =6), (c) appreciation of school and its benefits (n = 2), appreciation of computers and their benefits (n = 4), and perceptions of gender differences in computer abilities (n = 1). A final item asked whether students now had a computer at home.

Student progress survey. The Student Progress Survey (see Appendix A) was designed for administration to each student's mathematics, English, and computer teachers. The basic form asked the teacher to evaluate six areas of performance or motivation (subject interest, subject skills, motivation, independence, self-confidence, social skills) using a five-point scale varying from "inferior"

to "exceptional". Below the evaluation items was an open-ended section in which the teacher was invited to comment on the student's perceived strengths and weaknesses. The computer teacher received an additional section listing specific computer skill areas (knowledge of computer parts, keyboarding, etc.) for him/her to complete by evaluating each skill on a five-point scale (see Appendix A).

Parent survey. The parent survey contained a core section of 10 items and a special ACOT-specific section of 7 items. The core items were mostly statements regarding the role of computers in society and for improving learning (see Appendix A). Respondents reacted to each using a 5-point Likert-type scale, ranging from "strongly agree" to "strongly disagree." One additional item invited open-ended comments; another asked for an estimate of the time the child typically spent on homework each night. The ACOT section consisted of Likert-type items concerning the benefits of the program and the family's interest in computers and school this year compared to last.

Parent interview. Parents were asked the following questions by phone (see Appendix A):

1. How would you assess the quality of your child's school experience this year compared to last year?

2. What do you think your child liked best about school last year? What about this year?

3. Have you noticed any differences (performance, motivation, interest) in your child's school work this year compared to last year?

4. How much time do you spend with your child doing homework this year compared to last?

5. How does your child appear to feel about school this year compared to last year? Explain in terms of the amount of work, difficulty, interest, and motivation.

6. What effect did having the Apple computer in your home last year have on

your family?

7. Do you think your child will do as well this year in school without the Apple computer at home and at school?

8. Has your child expressed any career goals? If so what?

9. What did you like about the ACOT program last year? Explain.

10. What did you like least about the ACOT program last year? Is there anything they can improve? Explain.

Student interview. The student interview was given to both the ACOT and control groups (see Appendix A). It consisted of the following questions:

1. Describe your school experiences last year.
   a. What types of things did you learn and do? (What types of computer activities?)
   b. How much time did you usually work with the computer in school in a week?
   c. What did you like best about your school (ACOT) experiences?
   d. What did you like least about your (ACOT) experiences?
2. Describe your school experiences this year.
   a. What kind of things are you doing with the computer?
   b. How much time do you usually work with the computer in school each week?
   c. What do you like best about these experiences?
   d. What do you like least?
3. Compare this year's computer experiences to last year's.
   a. Which did you like better? Why?
   b. Is there anything better this year?
   c. What do you miss most about last year? Why?
   d. How would you rate your computer skills this year compared to last year?

4. Do you think that it's important for children your age to have a school computer to work with? Why or why not?

Computer teacher survey and interview. These assessments were designed for administration to the computer teacher at East High School who taught 11 children in the combined ACOT and control samples sometime during the year. The first eight items asked her to rate the ACOT group on their computer skills and attitudes using a five-point scale. Additional items asked her to compare the skills of males and females, identify the best computer students from the combined ACOT and control rosters, describe the types of computer applications students learned, and indicate the amount of class time they received. The computer teacher interview consisted of the following questions:

1. Do you know anything about the ACOT project? Is so explain.

2. Were you able to discern those students who were in ACOT last year from those who were not? If so, how?

3. Have you noticed any particular behaviors in the ACOT students as a group that you have not seen in other students?

4. Did you notice if any of the ACOT students were already familiar with the software? Did they do anything different as a consequence of having prior knowledge of the material?

5. Did the ACOT students make the highest grades in the computer class? Characterize their performance.

6. Were the ACOT students more willing to help others in the class who were not familiar with the material? If so, elaborate.

7. What advantages and/or disadvantages of the ACOT program can you conclude from having seen the ACOT students in class as seventh-graders?

Procedure

In October students were scheduled in small groups to attend a session that involved administration of the keyboarding test and the attitude survey. For the

keyboarding test, the student was seated at the computer and given introductory instructions. The proctor monitored the student as he/she paged through the opening information screens and began the actual test. If any problems occurred, the proctor assisted the student and let him/her continue. At the completion of the test, the students were directed to the adjacent room where the attitude survey was to be taken. The proctor then recorded the keyboarding scores from summary display provided by the program. Students were administered the attitude survey individually or in small groups. Each item was read aloud as students read it silently.

Also in October, the students' English, mathematics, and computer teachers were administered the Student Progress Surveys. This was done by distributing the forms to the school guidance counselor (or other representative) who then supervised the distribution and collection of the forms.

Administration of the parent survey was initiated in March. Initially, the surveys were mailed to parents with instructions to return them in the stamped, addressed envelope provided. (If both the father and mother lived at home, either one could complete it.) This procedure produced a low return rate, mainly due to changes of addresses or incomplete address information that prevented or delayed delivery. A second, much more successful procedure involved having the students bring the forms home and return them when completed. The ACOT parent interview was conducted about one month later by randomly selecting 10 of the students and calling their homes to schedule a phone interview. All parents contacted agreed to participate in the interview, which generally lasted about 10-20 minutes.

In April, the keyboarding test and attitude survey were readministered under the same procedure used in the fall. Following the attitude survey, students were interviewed individually for about 15-20 minutes. The Student Progress Surveys were also readministered to the teachers as done in the fall. The

computer teacher at East High School was interviewed for about 60 minutes by the principal investigator. Finally, in June reading and mathematics subscores from the California Achievement Test (CAT), administered in the fall of 1988 and spring of 1989, were obtained from school records.

Results

Results are discussed in the following sections according to the following data sources: (a) teacher ratings and grades, (b) computer teacher interview, (c) student surveys, (d) parent surveys, (e) parent interviews, (f) keyboarding test, and (6) CAT scores.

Teacher Ratings

Mathematics. Mathematics teachers returned 23 ACOT surveys (96%) and 29 control surveys (100%) in the fall, and 17 ACOT surveys (71%) and 19 control surveys (70%) in the spring. Results are summarized in Table 1. For each performance category, a 2(group) x 3(rating) chi-square test of independence was performed. To achieve significant cell frequencies, the two highest and the two lowest ratings from the original five-point rating scale were each combined, as reflected in the table. None of the chi-square results was significant, thus failing to support the hypothesized advantage for the ACOT group over the control group. Looking at the table, the percentages of students receiving the different ratings were nearly identical for the two groups in the fall survey. In the spring survey, however, there was some tendency for the percentage of "high" evaluations for the ACOT group to increase relative to their fall evaluations and to the control group on the "interest in subject" and "skills" dimensions. However, within-groups comparisons of fall and spring ratings showed no significant changes on these or any other items for either group.

Groups were also compared, using *t* tests for independent samples, on the combined score (maximum=30) across all six evaluation items. The overall fall means were 17.4 for ACOT and 18.0 for control, which were not significantly

different, t (50) = -.64, $p > .05$. Differences in the spring means approached significance, t (35) = 1.71, $p < .10$, with ACOT (M = 18.5) surpassing control (M = 16.4). Finally, comparison of the final math grades (0 to 4.00 scale) received by students showed no difference between groups (ACOT M = 1.76, Control M = 1.42), t (34) = .98, $p > .05$. Both groups achieved relatively poorly, with their combined grade distribution consisting of 17% F's, 30% D's, 33% C's, 17% B's, and 3% A's.

Insert Table 1 about here

English. English teacher ratings are presented in Table 2. As can be seen, the fall ratings were generally higher for the ACOT group than for the control group, but effects reached significance only on social skills ($p < .05$). On that category, approximately twice as many ACOT than control students were rated as high (above average/exceptional) whereas the converse was true for low (below-average/inferior) ratings. On the spring survey, however, the ratings tended to be more similar for the two groups, with no significant differences indicated on any category. However, within-groups comparisons, using t tests, showed a significant decline from fall to spring for the ACOT group in the "self-confidence" rating, t (16) = -3.92, $p < .001$. The control group ratings significantly increased on the "interest" rating, t (19) - 2.52, $p < .05$, and on the "independence" rating, t (20) = -2.79, $p < .05$. Comparison of combined scores indicated a significant advantage for the ACOT group (M = 16.3) over the control group (M = 13.4) in the fall, t (51) = 2.06, $p < .05$, but not in the spring (M's = 13.0 and 15.1, respectively). English grades for the spring were quite low and not significantly different between groups, (ACOT M = 1.12; Control M = 1.32). The combined group grade distrbution was 19% F's, 39% D's, and 42% C's.

Insert Table 2 about here

Computer. In the fall, only 5 out of the 53 students had received any school-based computer training; given this very small n, no analysis of the surveys were performed. In the spring, 11 students (9 ACOT and 2 Control) had taken a computer course sometime during the year. Examination of the ACOT students' scores showed that the students were evaluated most positively on interest (30% "above average," 70% "average") and computer skills (40% "above average," 60% "average"). Lower ratings were obtained on motivation (30% "below average"), independence (30% "below average," 20% inferior), self-confidence (20% "below average"), and social skills (30% "below average"). The modal group rating was "average" in word-processing skills; "average" to "above average" in knowledge of computer parts, operations, and programming; and "above average" in using a word-processor. Applications of a spreadsheet or a data base were not part of the seventh-grade curriculum, and thus were not assessed by the teacher. Both of the control students in the sample were average to above average in all areas.

Open-ended teacher comments. English, mathematics, and computer teachers' comments about individual students' strengths and weaknesses were content analyzed by coding key phrases and comparing groups for similarities and differences in student characteristics. Comments were also compared for changes in teacher perceptions from fall to spring semesters for both groups. Comments across both ACOT and control groups were very similar both in the fall and spring with no particular characteristic more often cited for one group than the other. The most often mentioned student strength was mastery of the basic academic skills to do the required work. The next most frequent comment about student strengths was that students had the ability to perform at much higher levels than

they actually did. Other strengths noted were that stdents were motivated, tried hard, were cooperative and had pleasant personalities. In 19 instances in the ACOT group and 12 in the control grup, teachers did not list any strengths but did list weaknesses. In almost all of these cases, the weaknesses revealed a behavior or negative attitude problem with the students which may have accounted for teachers' lack of positive comments. In only very few cases did the English teacher's perception of the individual student differ considerably from the math teachers' or vice versa.

Student weaknesses most often cited for both groups were classroom behavior lack of motivation, poor academic skills, and distraction by peers and consequent off-task behavior. Teacher perceptions generally did not change substantively from fall to spring for either of the groups. A listing of all open-ended comments, broken down by semester and subject, are provided in Appendix D.

Computer Teacher Interview

The computer teacher interview consisted of a combination of forced-choiced and open-ended questions. Altogether, she taught 9 out of 16 ACOT students and 2 out of 26 control students who attended her school. She had 9 years experience teaching computer. The specific course taught was a basic literacy type covering programming in BASIC, word-processing, and computer operations and functions (i.e., how a computer works). The Understanding Computers software series from Encyclopedia Britannica was used to support the latter instruction. Students taking the course averaged five hours per week of class time for one semester.

The interview began by showing the teacher a list of the students she taught from the present samples, without an indication of their group. She was asked to identify the 5 "best" students. Both of the control students (100%) and three of the nine ACOT students (33%) were selected. After members of the ACOT group were identified, she was then asked to think about those students and compare them as a group on eight dimensions to other students in the class. The results

are summarized on Table 3. ACOT students were rated as average on most dimensions, including those involving their enthusiasm and skills at using computers. They were rated as above average in keyboarding and basic familiarity with computers, and as superior in "not being hesitant" (being unafraid) to use computers. The teacher did not feel that there were any differences between girls and boys in attitudes or behaviors.

Insert Table 3 about here

The following sections summarize the teacher's responses to each of the seven open-ended questions.

Do you know anything about the ACOT project? The teacher knew a little about the ACOT project, such as the school at which it was implemented and its establishment of a computer-saturated environment. She knew little, however, about what specific computer activities were involved.

Could you discern the ACOT students from the others? The teacher believed that in the majority of cases she could discern ACOT students, but mainly on the basis of their keyboarding skills rather than computer skills.

What behaviors distinguish ACOT students? Again, the teacher emphasized that keyboarding skills were the most salient identifying characteristic. She also noted that the ACOT students were resistant to learning about the computer as a "subject" as opposed to using it as a tool. Other observations were that they were more interested than were other students in playing and copying computer games, less independent and self-sufficient in their work, and had shorter attention spans. In general, she created a picture of students' experiencing some difficulty in adjusting to the more structured setting of her computer class.

Were ACOT students already familiar with the software? Nearly all of the

software, including that used for word-processing, was new to the students. The ACOT students, therefore did not have the advantage of previous experience with specific programs. Further, she felt that they did not seem to transfer noticeably any experiences they might have had with similar software.

Did ACOT students make the highest grades? She did not feel that the ACOT students were making the highest grades, but were distributed evenly throughout the grade distribution.

Were ACOT students more willing to help others? She expressed disappointment with what she perceived to be a limited amount of classroom socialization. ACOT students did not appear to go out of their way to help others and were definitely not more social or helpful than others.

What advantages/disadvantages of ACOT are perceived? One advantage of ACOT was perceived to be a high amount of "comfort" with using the computer. ACOT students were definitely uninhibited about trying new things. They were also relatively knowledgeable about operating the computer (disk use, keyboard, etc.). A third advantage was their obvious superiority in keyboarding skills.

The major disadvantage perceived was the questionable amount of transfer that was noted from the prior year's experience to learning the new applications of the current year. Surprisingly, for example, ACOT students did not appear better skilled at using the word-processing program that was taught (AceWriter), even though all were highly experienced users of a different program (AppleWorks). The new commands appeared to frustrate some of them and to even cause some negative transfer. The more global understanding of word-processing that they would be expected to have acquired, for some reason, did not appear to help them learn the new program more readily or more effectively. The teacher also questioned the substance of what they had learned the previous year, feeling that it related more to "having fun" with computers rather than to becoming skilled in certain applications with a clear sense of purpose. She felt that many seemed to

be "missing a toy--like an Atari." Another disadvantage, in her opinion, was behavior problems. As a group, the ACOT students appeared to have less self-control and to be less focused than other students. A frequent example of such behavior was getting out of their seats and walking around the room. Again, she attributed this to what she believed to have been an unstructured, student-oriented ACOT environment compared to her more structured and teacher-controlled orientation.

Student Attitudes

Student attitudes are summarized in Table 4 for the fall and spring surveys. Comparisons between ACOT and control groups yielded only two significant differences. In the fall a greater percentage of the ACOT group (57%) than the control group (24%) disagreed that they could work with a computer as much as they want at school this year (Item 15). In the spring more ACOT (35%) than control (8%) students agreed that girls are better at using the computer than boys (Item 16). It should be noted that the proportion of females and males was almost identical for ACOT and control students. Also, the relationship between gender and the Item 16 responses was not significant.

Insert Table 4 about here

The responses generally show high agreement with statements indicating an internal locus of control (Items 1 and 9) although relatively fewer students (30% to 66%) agreed that they do well on tests due to ability factors (Item 8, an internal-stable attribution). There was also generally high agreement on items dealing with motivation (Items 2, 4, 6, and 11). Nearly all students liked learning with a computer (Item 14) and felt that working with a computer would help them later on (Item 7). About two-thirds of the students liked school (Item 5), and nearly all felt that what was learned in school would help them in the

future (Item 7). All but one ACOT student (96%) preferred typing an assignment on a computer over writing it by hand (Item 13); 22 out of 29 control students (79%) preferred typing. The numbers of ACOT and control students indicating that they had computers at home were only 2 and 4, respectively.

Responses appeared fairly consistent from the fall to the spring. The percentage of ACOT students who agreed that they liked school increased from 64% to 76% (Item #5). Fewer ACOT (27% less) and control students (16% less) in the spring than in the fall felt they succeeded because of ability (Item 8).

Student Interview

Those students interviewed were all 16 of the East High School ACOT students and 21 out of the 24 East control students. In addition, 3 out of 8 additional ACOT students were interviewed at other schools. Responses for the East sample are reported by question below so that direct comparisons between ACOT and control students attending the same school can be made; responses for three other interviewees are summarized in Appendix B.

Computer experiences last year. Both ACOT and control groups described similar activities, with "typing" being the most frequent response (100% of ACOT; 86% control). More control students than ACOT students indicated experiences with math programs (67% vs. 50%), whereas more ACOT students indicated experiences with Logo or drawing (75% vs. 20%) and word-processing (69% vs. 29%). Other activities mentioned by at least 25% of the students in both groups were English CAI and games.

Time on computer last year. Nearly all ACOT students indicated that they worked on the computer all day (81%) or half the day (13%) last year. All of the 19 control students who answered this question indicated that they spent less than an hour a day on the computer.

Best experiences last year. "Using the computer" was the most frequent response of both ACOT (38%) and non-ACOT students (29%). Other frequent

responses for both groups were typing and communicating with friends. More control students than ACOT students identified playing games (24% vs. 6%) and math CAI (24% vs. 6%). More ACOT students indicated that "using the computer made it easier to learn" (25% vs. 5%).

Least liked experiences last year. With regard to "least liked" experiences, the most common response for both ACOT (32%) and control (19%) was "nothing." Other control group responses were "not enough computer time" (14%), "two much text" (14%), and math drill (10%). ACOT students had very little consensus on least liked experiences, with no more than two selecting any one response (e.g., math drill and social studies).

Experiences this year. The majority of control students (53%) indicated that they had no contact with the computer this year. Other responses identified uses of computers in art class (33%) and for programming (14%). For ACOT students, 50% indicated programming, 31% art class, and 25% no experiences. With regard to the amount of time spent working with computers in school, 86% of the control students had none and 14% one hour or less per day. In contrast, 19% of the ACOT group had none, 75% had one hour or less, and 6% had more than an hour each day.

Best experiences this year. Few control students (only three) could answer this question as a result of their lack of contact with computers. Of the 12 ACOT students who responded, 4 identified programming, 4 "working with computers," 2 Logo, and 2 reading CAI.

Least liked experiences this year. The few students who responded to this question most frequently indicated "not having a computer" and "not having enough programs."

Which year is better? Of the 16 ACOT students and 17 control students who responded, 15 of each group (94% and 88%, respectively) indicated that last year was better. There were many comments, especially by ACOT students, that last

year they learned more, had more fun, more computer programs, and more computer time. Strong feelings were expressed of being "left out" this year by not being able to use computers. When asked if anything was better this year, there were only three responses: two of the ACOT students mentioned programming and one liked the computer-based art activities.

What do you miss most? For control students the most frequent responses were games (38%) and typing assignments (38%). Others indicated that they missed not being able to use computers, drawing with the computer, and having computers in the classroom. ACOT students most frequently mentioned typing (50%) and the bulletin board tutoring (31%). Other responses given by two or more students were "having the computer at home" and as "a friend." "Games" and "visitors" were each selected by only one student.

Skills this year compared to last. Of the 20 control students who responded, 50% felt their skills this year were worse, 25% felt they were better, and 25% the same. For the 14 ACOT students who responded, the distribution was 50% worse, 21% better, and 29% the same.

Importance of a school computer. Both ACOT and control students overwhelmingly (close to 100%) expressed the belief that it is important for students their age to have a school computer. One popular reason was because of better preparation for a job. Five control students also felt that computers can help you to write better (no ACOT students gave this response). Seven ACOT students indicated that the computer allowed them to communicate with tutors who were helpful to them last year.

Summary. The responses of ACOT and control students were generally more comparable than different. This was not viewed as surprising, since the control group's contact with computers the previous year was quite extensive relative to most sixth-graders in the city school system. Thus, both the ACOT and control students were reacting as individuals who had "lost" their computers and

privileged status this year. Where different reactions were expressed, they therefore tended to concern specific aspects of last year's program (i.e., missing a particular activity), but the basic frustration of this year compared to last year was strongly conveyed by both groups. Reflective of that frustration, 50% of both groups felt that their computer skills were worse this year compared to last. One outcome that was observable, if not directly obtainable through questioning, was the excitement in the students' eyes when they talked about computers. For many, there appeared to be an emotional attachment to the computers. The immediate feedback that the computer gave was one important factor. One student said it was easier to learn from the computer because it corrected you when you first begin to make errors. Four students mentioned that the computer could often help when the teacher could not. For many of these students, the computer was definitely a motivating force in their learning. Seven of the students found the tutors very helpful. Two mentioned problems with not being able to get in touch with or understanding their tutors. One had telephone problems and gave up using the bulletin board entirely. Other comments were that the assignments were extra work and were not integrated into the class' normal, graded workload. The visitors and news media coverage made some of the students feel very important but was not missed nearly as much as being able to work with a computer

Parent Survey

The number of parents returning surveys was 14 of the ACOT sample (58%) and 19 of the control sample (70%). However, when only the East High sample is considered both return rates become 75%. This was a result of the East High School guidance counselor encouraging students to return the completed surveys.

Results, which are presented in Table 5, show a high degree of agreement that the computer is important to society and to children's learning. Among the ACOT parents there was 100% agreement on four out of the eight core items, with all

but one parent agreeing (or expressing a supportive view of computers) on three others. Although there were no significant differences between groups on any individual item or on the cumulative score, the control parents were slightly less positive as a group. The largest group difference showed 37% (n = 7) of the control group compared to 14% (n = 2) of the ACOT parents undecided or disagreeing that learning to use computers is easy. It should be recalled that unlike the ACOT parents, control parents did not have a computer at home and thus, lacked opportunity to interact with one.

Insert Table 5 about here

Responses to the ACOT section of the survey were also extremely positive, with almost all parents agreeing with the statements about the benefits of the ACOT program for their children and family. One-third of the parents disagreed that their child was doing as well in school this year compared to last year. All parents strongly agreed that they would like for the ACOT program to have been continued in the seventh grade. On an additional item (not shown in the table), parents were split on their degree of involvement with their child's school activities compared to last year, with equal numbers (n = 4 each) selecting "more," "same," and "less."

Parent Interviews

The purpose of the parent interviews was to assess parental attitudes about their children's ACOT experiences compared with their conventional seventh-grade classroom experiences one year later. Do parents perceive their children's ACOT experience as helpful? Do they spend an equal amount of time helping their children this year as last? Are they satisfied with the ACOT program? Ten of the 16 ACOT parents whose children were attending East High School were selected to participate in a 10-item structured interview. Results are summarized below.

A listing of the specific responses and the frequency with which each was given is provided in Appendix C.

After a brief explanation of the purpose of the interview, a majority of parents immediately began to express regret that their children no longer had unlimited computer access. In an attempt to "restore" this access and with the feeling that their own responses may have some bearing on such a possibility, some parents may have attempted to deliberately bias their responses to certain questions; however, it was the opinion of the interviewer that they generally reported their true feelings regarding to the ACOT program.

Without exception, all parents were cooperative and even delighted that ACOT was following up outcomes. They were flattered that ACOT was interested in their opinions and the welfare of their children. This belief provided a positive relationship between the interviewer and respondents. Parents were highly enthusiastic in their discussions about ACOT experiences. Questions were asked exactly as prepared on the Parent Interview form (see Appendix A). Varying degrees of explanation and probing were needed to guide parents in understanding the exact nature of certain questions. Responses were recorded even when they seemed not to be necessarily in answer to the specific question asked.

Question 1, comparing the quality of the school experience this year with last year, resulted in varied responses. One parent felt the computer provided a needed challenge last year; however, another felt that his child had difficulty adjusting after the absence of the computer. Several mentioned their children's difficulties related to common developmental and social adjustment problems of moving from elementary to junior high.

Question 2, regarding what their child liked best last year, produced overwhelming support for the "computer" during sixth-grade, but no significant overall preference this year.

Question 3, asking about any differences in school performance and

motivation, indicated that there was some greater degree of motivation last year (4 parents responded as such). Three parents indicated that grades were lower this year; two said that their children studied harder this year.

Question 4, concerning the amount of time spent helping with homework, indicated that for various reasons, seemingly unrelated to ACOT, 6 out of the 10 parents spent more time last year than this. Explanations for the responses given are presented in Appendix C.

Question 5, comparing the child's feelings about school this year with last year, indicated that four children liked school better in the seventh grade. Another four parents responded that academics were more difficult this year, but could not say that the children liked it more or less.

Question 6 responses regarding the effect of the Apple computer in the home were overwhelmingly positive. Nine of the ten parents had helped with set-up. It seemed that everyone in the environment (which at times included extended family members) used the computer. Adults, in particular, were likely to try to learn or brush up on computer/typing skills.

Question 7, asking for a prediction of academic success this year without the computer, received four comments of "definitely worse without it." Only three felt their children would do as well without the computer in their homes.

Question 8, which concerned future career goals, yielded overwhelming support for their children's interest in the computer field with half indicating some career interest in that area.

Question 9, which asked the parents what they liked about ACOT, produced the widest variety of responses. The most common included having been provided an opportunity that would not have otherwise been realized and the opportunity for hands-on learning exposure. Next in frequency were comments concerning the bulletin board/tutor concept. They liked the idea of their child having a tutor and using the computer to write and receive messages.

Question 10 concerning what they liked least about ACOT or what improvements were needed indicated extremely high satisfaction with the way in which the program operated. One parent strongly recommended coordinating the computer curriculum with the textbook chapters. One said it tied up her family's phone line. Another did not like the fact that it only lasted one year.

In conclusion, parents clearly perceived the ACOT experience as helpful to their children. For whatever reasons and to whatever ends, they are spending less time helping with homework than last year. They also feel that their children are having a more difficult time this year than last year.

Keyboarding

The keyboarding results showed a clear superiority of the ACOT group over the control group. In the fall, ACOT students averaged 38.7 words per minute compared to the control group's 17.6 words per minute, t (47) = 7.61, $p < .001$. In the spring, the respective group means were 37.4 and 15.8, t (44) = 6.45, $p < .001$.

California Achievement Test Scores

Students took the reading and mathematics subtests of the California Achievement Tests in September and May of the school year. Raw score comparisons between the ACOT and control groups are summarized in Table 6. Results showed the ACOT group to be superior on all measures, but their advantages in reading only approached significance (both p's < .10), while mathematics scores were highly significant.

Insert Table 6 about here

Discussion

The discussion of findings will be oriented around the four research questions presented in the introductory section of this report.

Do ACOT Students Demonstrate Advantages Over Control Students?

Given the multiple and varied measures of student outcomes assessed in this study, there is no simple answer to the question of whether the ACOT group was superior to the control group during their seventh-grade year. On certain measures, some advantages were indicated; on most measures, however, there was no advantage for either group. On teacher ratings, of the 24 item comparisons made (6 items x 2 subjects x 2 surveys), there was only one significant group difference: ACOT students received higher fall-English ratings on social skills. Analyses of composite ratings further revealed an advantage for the ACOT group in fall-English evaluations. With regard to grades, the most revealing finding was that both groups performed poorly, earning mostly C's and D's and only one A in their combined English and math distributions.

Based on these results, the motivation and achievement of the ACOT students can be considered to be at least as high as (and perhaps in some instances slightly better than) the control group's. But, overall, ACOT students were not distinguishable from other students on the basis of their school accomplishments. Seemingly, they remain at risk in middle-school, despite their accomplishments in the ACOT class. Evidence that must be viewed positively, however, was the ACOT group's clear superiority on the mathematics CAT (fall and spring Effect Size = .94 and 1.02, respectively) and close to significant advantage on the reading CAT (ES = .58 and .63). These differences exceed those found for the previous year (Kitabchi, 1988), and make it difficult to rule out the possibility that the ACOT experiences did have some long-term carry-over effect on basic skills. It would be interesting to extend the longitudinal analysis to determine whether these advantages in CAT scores are maintained.

As encouraging as the CAT results appear to be, evaluations of ACOT students' performance by the seventh-grade computer teacher were most disappointing. In both her ratings and personal comments, she definitively conveyed that ACOT students "blended in" the class with regard to their computer skills and course performance. A positive characteristic was their superior skills in keyboarding; negative characteristics were their restlessness, impatience, and surprisingly, lack of independence. Also surprising was that, in the teacher's view, ACOT students did not excel in using a word-processor, an application they had used extensively and skillfully in the past (Woodson, 1988). In interpreting these findings, it is important to consider that this teacher used a relatively structured, teacher-centered orientation in which the computer itself was the focus of learning. This approach was quite different from the ACOT classroom in which students were freer to explore applications of computers to perform particular tasks. An analogy might be made to art students whose former experiences have mainly involved free expression and exploration of painting techniques but are now being asked to study the fundamentals of painting and do their work "by the numbers." Although the latter knowledge is certainly important, the adjustment required may be difficult. For ACOT students, those adjustments needed to be made immediately and totally, as there was no transition to bridge the structural and pedagogical differences between the ACOT and the seventh-grade programs.

Computer Access in the Post-ACOT Year

Our findings clearly indicated that students' seventh-grade computer experiences were extremely limited. With the exception of the approximately 25% who, due to being admitted to the city school's "optional" program, were able to take a one-semester computer course, students had at best intermittent, brief opportunities to use the computer. At worst, they had no contact at all (19% of the ACOT group and 86% of the control group). Even the computer course provided

an average of less than one hour of contact each day, a substantial decrease from the virtually all-day exposure provided in the ACOT classroom. Given that only a handful of students (n = 6;11%) had home computers, it can reasonably be concluded that for the typical ACOT student, opportunities to practice and apply the computer skills they had learned were virtually nonexistent in the seventh-grade year.

Parent Attitudes

Parents were consistently positive about the ACOT program and its perceived benefits for their children. There was a definite feeling that the computer experiences motivated the children and involved them in positive learning activities that would otherwise have been unavailable. Word-processing and use of the BBS at home were two tangible signs of their children's skills with the new technology and willingness to spend free time at home engaged in school-related activities. Many of the parents also depicted the home computer as a type of "center piece" that attracted family members and engaged them in exploring its uses. Not only would the computer be missed by the child at school, but also by the family at home. Unfortunately, limited budgets for these economically disadvantaged families make it unlikely for most that purchases of home computers will occur any time soon.

Overall, the parents expressed less involvement with their children's school activities this year. They were also disappointed in how their children were performing compared to last year. Many conditions, including adjustment to a new school and more challenging curriculum, were seen as contributing factors. In the parents' eyes, the discontinuation of ACOT, with its computer experiences and parental involvement component, was a major loss for the child and family in the current year.

Trends Across the Post-ACOT Year

A final research question was whether the performances and attitudes of ACOT

students would show any significant trends of declining or increasing across the post-ACOT school year. Results provided no such indication. In mathematics, for example, ACOT students tended to receive somewhat higher teacher ratings in the spring than in the fall, whereas in English the reverse was true. Only one fall-to-spring comparison (indicating a decline in self-confidence in English) out of the many performed was significant. Nor did differences between the ACOT and the control groups vary to any noticeable degree across the two assessment periods. Both groups experienced difficulty adjusting to the new school and their problems appeared to persist the entire year. Only by examining the groups over time could we learn whether, after integration into the new school environment becomes better established, any carry-over effects of the ACOT experience are more likely to operate.

Conclusion

Overall, the results failed to show that ACOT students were distinguishable from their classmates in attitudes or achievement. On the positive side, where differences were found, they consistently favored the ACOT group (e.g., CAT scores), but given conditions of the program and school environment, it may be unrealistic to expect larger or more consistent effects to have occurred. The literature on remedial programs (Hodges & Smith, 1978; Evans, 1971) and on strategies for teaching at-risk students (Slavin & Madden, 1989) is discouraging regarding the probability of attaining long-term gains from short-term interventions especially with children beyond kindergarten or first grade. Aside from the limited duration of the ACOT program, a second limiting factor for the present ACOT sample was entering a new school environment featuring different teachers for each subject, greater structure, increased competition, and fellow students who knew nothing about ACOT and the special status its participants enjoyed the previous year. These changes from the previous year were undoubtedly stressful and demanding. A third limiting factor concerns the issue of computer

access. The foundation of the ACOT philosophy and experience is learning to use computers as an educational tool. If no computers are subsequently available, the applicability of those experiences will be severely limited. Currently in the literature on computer-based learning, frequent use is made of the term "empowerment" to describe the role of the computer in enabling students and teachers to expand their view of the world and what they can accomplish (e.g., Pearlman, 1989). In a similar vein, an automobile can be viewed as empowering people to expand how fast and far they can travel. But, just because one has learned to drive does not mean that he/she can also travel farther or faster without a car. From this perspective, ACOT students may be percived as individuals who have successfully learned to drive and, with access to cars, can potentially extend their reach far beyond what it was. In a world without automation (the seventh-grade class), however, that means of special empowerment no longer exists. Through this analogy we take the view that learning to use computers expands one's potental range of accomplishments in situations where those particular skills can be applied; it does not necessarily lead to decontextualized transfer that makes one smarter or able to accomplish more in learning activities not involving the computer (e.g., see Perkins & Solomon, 1989).

Based on the above interpretations, the following recommendations are made to increase the transferability of the ACOT experiences to learning in conventional classrooms.

1. Where computer-intensive experiences are made available, provision needs to be made for a transition from that environment to conventional classes. In the present program, for example, the sixth-grade ACOT teacher and seventh-grade computer teacher had little awareness of what the other was doing in her class. With better communication, a bridge and smoother transition between programs could be achieved.

2. Through computer-intensive experiences, children are likely to become highly skilled at using computers for learning. They do not necessarily become better at English or social studies in the process (unless the computer-supported learning involves those subjects). The transferability of ACOT thus most strongly depends on the availability of computers to students in post-ACOT classes.

3. Related to the above concern, it may be unreasonable to expect ACOT experiences to directly translate into higher basic skills. During the past two years, much of the emphasis has been devoted to setting up the ACOT classroom and teaching students and teachers how to use different computer applications, such as word-processing, Logo, and graphics. Only when computer experiences are directly derived from and oriented to specific curriculum objectives should test scores based on those objectives be expected to increase. Now that the ACOT classroom and routine have been established, a more focused curriculum integration, using more CAI, needs to be achieved.

4. It seems unreasonable to expect only one or two years of working in a computer-intensive environment to result in significant changes in academic ability or performance (see Slavin & Madden, 1989). With extended program experiences, starting in earlier grades and continuing for longer periods, the likelihood of noticeable program impacts should greatly increase.

5. Parents' reacted overwhelmingly in support of the ACOT program. That approximately 70% returned questionnaires and 100% of those contacted agreed to be interviewed were taken as further evidence of their commitment to and interest in the children's education, particularly in relation to computers. Parents are a key element in helping at-risk students to succeed in school (Slavin & Madden, 1989). Greater effort, therefore, needs to be devoted to expanding the involvement of parents in the ACOT program throughout the school year.

Although the ACOT students' measured superiority over the control group was

limited to only a few performance variables, a clear distinguishing characteristic was the excitement in their voices and faces when they talked about their experiences the previous year. Equally discernible was their disappointment regarding the lack of computer activities in the current year. A main implication of Memphis ACOT is that by being able to work with computers, all children, perhaps especially disadvantaged ones, can increase the range of their accomplishments while developing skills with modern technological applications valued by society. As they acquire and demonstrate those skills they can feel positively about themselves, possibly in ways they have never experienced before. But to remain so "empowered," students must have access to the tools on which those successful performances depend. The experience of having worked with a computer in the past is of doubtful value if there are no computers to work with now.

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Table 1

Percentage of students evaluated in different performance categories by mathematics teachers in fall and spring surveys.

	Fall				Spring			
Performance Category	High[a]	Average	Low[b]	χ^2	High[a]	Average	Low[b]	χ^2
1. Interest in Subject								
ACOT	21.7	52.2	26.1	.05	41.2	29.4	29.4	3.21
Control	24.1	51.7	24.1		15.0	40.0	45.0	
2. Skills								
ACOT	21.7	52.2	26.1	.33	35.3	35.3	29.4	1.84
Control	47.6	44.8	27.6		20.0	30.0	50.0	
3. Motivation								
ACOT	21.7	47.8	30.4	.17	29.4	35.3	35.3	1.43
Control	21.4	42.9	35.7		20.0	25.0	55.0	
4. Independence								
ACOT	30.4	52.2	17.4	1.24	35.3	52.9	11.8	3.98
Control	27.6	44.8	24.1		30.0	30.0	40.0	
5. Self-Confidence								
ACOT	13.0	78.3	8.7	.24	11.8	82.4	5.9	.96
Control	17.2	72.4	10.3		15.0	70.0	15.0	
6. Social Skills								
ACOT	13.0	69.6	17.4	.17	5.9	88.2	5.9	1.10
Control	17.2	65.5	17.2		10.0	75.0	15.0	

Note. [a]ACOT-Fall n=23, ACOT-Spring n=17, Control-Fall n=29, Control-Spring n=20. [a]High = "Exceptional" and "Above Average" categories combined. [b]Low = "Below Average" and "Inferior" categories combined

Table 2

Percentage of students evaluated in different performance categories by English teachers in fall and spring surveys.

	Fall				Spring			
Performance Category	High[a]	Average	Low[b]	χ^2	High[a]	Average	Low[b]	χ^2
1. Interest in Subject								
ACOT	12.5	41.7	45.8	1.87	11.8	35.3	52.9	.36
Control	3.4	37.9	58.6		10.0	45.0	45.0	
2. Skills								
ACOT	8.3	33.3	58.3	1.37	5.9	41.2	52.9	1.65
Control	3.4	34.5	58.6		--	55.0	45.0	
3. Motivation								
ACOT	13.0	30.4	56.5	.19	11.8	23.5	64.7	.38
Control	17.2	27.6	55.2		14.3	42.9	42.9	
4. Independence								
ACOT	20.8	41.7	37.9	4.17	11.8	29.4	58.8	.99
Control	10.3	24.1	64.5		14.3	42.9	42.9	
5. Self-Confidence								
ACOT	29.2	41.7	29.2	3.63	--	29.4	70.6	3.29
Control	17.2	27.6	55.2		4.8	52.4	42.9	
6. Social Skills								
ACOT	20.8	54.2	25.0	6.07*	11.8	29.4	58.8	.80
Control	10.3	31.0	58.6		4.8	38.1	57.1	

Note. ACOT-Fall n=23, ACOT-Spring n=17, Control-Fall n=29, Control-Spring n=20
[a]High = "Exceptional" and "Above Average" categories combined. [b]Low = "Below Average" and "Inferior" categories combined.
* $p < .05$

Table 3

Computer teacher overall ratings of ACOT students' abilities relative to other students.

Dimension	Rating[a]
Enthusiasm	Average
Followed Directions	Average
Keyboarding Skills	Above Average
Unafraid to Use Computers	Superior
"Computer Buffs"	Average
Computer Skills	Average
Social Interactions	Average
Familiarity with Computers	Above Average

[a] Rating was on a five-point scale: "Superior," "Above Average," "Average," "Below Average," "Inferior"

Table 4

Percentage of students selecting different response categories on the fall and spring surveys.

Item	Fall						Spring					
	ACOT			Control			ACOT			Control		
	Agree	Und	Disag	Agree	Und	Disag	Agree	Und	Disag	Agree	Und	Disag
1. When I try hard, I am usually successful.	100	--	--	97	3	--	95	--	5	95	4	--
2. I usually do my very best on whatever I do.	83	13	4	76	21	3	76	19	5	83	13	4
3. No matter how hard I try, I usually make low grades.	17	17	65	17	21	62	14	19	67	17	29	54
4. I work hard on school assignments.	82	9	9	90	7	3	91	10	--	92	8	--
5. I like school.	64	23	14	69	24	7	76	14	10	71	25	4
6. I usually keep working on a problem until I solve it.	70	17	13	59	24	17	65	15	20	79	4	17
7. What I learn in school will be useful for the rest of my life.	90	5	5	97	3	--	91	10	--	96	4	--
8. I do well on tests because of my ability.	57	22	22	66	21	14	30	55	15	50	42	8
9. The person who has the most control over my grades is me.	91	--	9	90	10	--	81	10	9	92	8	--

Table 4 (Continued)

Percentage of students selecting different response categories on the fall and spring surveys.

Item	Fall						Spring					
	ACOT			Control			ACOT			Control		
	Agree	Und	Disag	Agree	Und	Disag	Agree	Und	Disag	Agree	Und	Disag
10. When I do well on tests it is usually because I was lucky.	13	4	83	17	10	72	5	5	90	17	13	72
11. I like to do new and different things in class.	100	--	--	100	--	--	95	--	5	88	12	--
12. Teachers make tests too difficult for me to do well.	9	35	57	28	14	59	5	15	80	20	33	46
13. I would rather type an assignment on a computer than write it by hand.	96	4	--	79	14	7	95	5	--	79	12	8
14. I like to use a computer to learn.	100	--	--	97	3	--	95	5	--	88	8	4
15. I can work with a computer as much as I want at school.	22	22	57	21	55	24	15	15	70	29	33	37
16. Girls are better at using computers than boys.	13	39	48	17	38	45	35	20	45	8	50	42
17. Learning to use a computer will help me later on.	96	4	--	87	10	3	89	--	10	92	8	--

Table 5

Percentage of parents indicating different levels of agreement on attitude items.

Item	ACOT			Control		
	Agree	Not Sure	Disagree	Agree	Not Sure	Disagree
Core Items						
1. Computers have improved the quality of life.	100	--	--	100	--	--
2. Computers are just a passing fad.	--	7	93	11	11	78
3. People who know how to use computers can get better jobs.	93	--	7	79	16	5
4. It is important to know how to use computers.	93	7	--	95	5	--
5. I am glad my child uses a computer at school.	100	--	--	100	--	--
6. It is easy to learn how to use a computer.	85	7	7	63	32	5
7. Children learn more by using a computer.	100	--	--	100	--	--
8. I am satisfied with my child's computer learning experiences.	100	--	--	100	--	--
ACOT Items						
1. My child is a better student today as a result of participating in the ACOT program.	92	8	--			
2. My child is more self-confident as a result of participating in the ACOT program.	100	--	--			
3. My child seems to have the same amount of interest in computers as he/she did last year.	82	9	9			

Table 5 Continued

4. My family seems to have the same amount of interest in computers as it did last year.	82	9	9
5. My child seems to be doing as well in school this year as last year.	67	--	33
6. I would like for the ACOT program to have been continued in the seventh-grade.	100	--	--

Note: ACOT n =14; Control n =18

Table 6

ACOT vs. Control Comparisons of Mean CAT Raw Scores

	Time of Testing and Group					
	September			May		
Subtest	ACOT	Control	t	ACOT	Control	t
	(n=24)	(n=26)		(n=24)	(n=25)	
Reading	55.4	46.4	1.94	65.3	55.4	1.82
Mathematics	64.5	53.7	3.22*	77.0	60.3	3.75**

* $p < .01$
** $p < .001$

APPENDIX A

DATA COLLECTION INSTRUMENTS

Student Survey

Please react to each of the statements by indicating how much you agree or disagree. Circle the letter of the response on the answer sheet that best decribes your feeling. Please be honest; your responses will be used by the researchers only and will not be shown to anyone who knows you.

	Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree
1. When I try hard, I am usually successful.	A	B	C	D	E
2. I usually do my very best on whatever I do.	A	B	C	D	E
3. No matter how hard I try, I usually make low grades.	A	B	C	D	E
4. I work hard on school assignments.	A	B	C	D	E
5. I like school.	A	B	C	D	E
6. I usually keep working on a problem until I solve it.	A	B	C	D	E
7. What I learn in school will be useful for the rest of my life.	A	B	C	D	E
8. I do well on tests because of my ability.	A	B	C	D	E
9. The person who has the most control over my grades is me.	A	B	C	D	E
10. When I do well on tests it is usually because I was lucky.	A	B	C	D	E
11. I like to do new and different things in class.	A	B	C	D	E
12. Teachers make tests too difficult for me to do well.	A	B	C	D	E
13. I would rather type an assignment on a computer than write it by hand.	A	B	C	D	E
14. I like to use a computer to learn.	A	B	C	D	E

Over.....

Student Progress Survey

Student: _____ Date: _____

Subject: _____ Teacher: _____

MATHEMATICS ENGLISH COMPUTER

A. Please rate the student on each of the following items based on his/her current (or most recent) performance in the subject indicated above.

	Excep-tional	Above Average	Average	Below Average	Inferior
1. Interest in subject	1	2	3	4	5
2. Skills in subject	1	2	3	4	5
3. Motivation to achieve	1	2	3	4	5
4. Ability to work independently	1	2	3	4	5
5. Self-confidence	1	2	3	4	5
6. Social skills	1	2	3	4	5

B. Describe in the space provided below your perceptions of the students' strengths and weaknesses in this subject.

Strengths:

Weaknesses:

C. Please evaluate the student's skills in each of the following areas. (Circle U if performance on the skill listed is unknown.)

	Excep-tional	Above Average	Average	Below Average	Inferior	Unknown
1. Knowledge of computer parts and operation	1	2	3	4	5	U
2. Keyboarding (typing)	1	2	3	4	5	U
3. Using a word processor	1	2	3	4	5	U
4. Programming (in Logo, Basic, or other language)	1	2	3	4	5	U
5. Using a Spreadsheet	1	2	3	4	5	U
6. Using a Data Base	1	2	3	4	5	U

Are there any major skill areas not listed on which students are evaluated? If so, please identify them and rate this student's progress.

PARENT SURVEY

Please react to the following statements by circling the letter of the response that best describes how you feel. Your responses will be kept completely confidential; so please respond according to your true feelings.

	Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree
1. Computers have improved the quality of life.	A	B	C	D	E
2. Computers are just a passing fad.	A	B	C	D	E
3. People who know how to use computers can get better jobs.	A	B	C	D	E
4. It is important to know how to use computers.	A	B	C	D	E
5. I am glad my child uses a computer at school.	A	B	C	D	E
6. It is easy to learn how to use a computer.	A	B	C	D	E
7. Children learn more by using a computer.	A	B	C	D	E
8. I am satisfied with my child's computer learning experiences.	A	B	C	D	E

9. You are invited to comment on your reaction to Item 8. Why are you satisfied or not satisfied?

10. Approximately how much time on the average does your child spend each day doing homework after school? (Check one)

___ less than 15 minutes
___ 15-30 minutes
____ 30 min. to one hour
____ 1-2 hrs.
____ more than 2 hrs.

over

PARENT INTERVIEW

My name is \ \. Thanks for agreeing to be interviewed regarding your child's school experiences. I'm going to ask you about 10 questions. There are no right or wrong answers, so just respond the way you feel. I will be taking notes so that I will have a record of your responses, but your identity will be kept completely confidential. Be sure to let me know if you are not sure what I'm asking.

1. How would you compare the quality (effectiveness, worth, educational value) of your child's school experience this year with last year? (Explain; what is different? What have you noticed?)

2. What do you think your child liked best about school last year? This year?

3. Have you noticed any differences (performance, motivation/interest) in your child's school work this year compared to last year? (Explain how this year is different.)

4. How much time do you spend with your child doing homework this year compared to last (more, less, the same)? (If a difference, ask for an explanation)

over

Student Interview

* Use bracketed expressions only with ACOT students.

Introduction

Hello, _____. I'm _____ and I'd like to ask you several questions about some of your experiences using computers. There aren't any right or wrong answers to these questions, so just answer the way you feel. I will be recording your answer so that I'll be able to write it out later. Stop me at any time if you don't know what I'm asking you. Also, what you say is completely between us--it will not be told to anyone else. Ready to begin? O.k., here is the first question.

Interview

1.a. Tell me about your school computer experiences last year [in the ACOT program]. What types of things did you learn and do?

(Probe to find out about things like keyboarding, games, CAI, AppleWorks, etc.).

b. How much time did you usually work with the computer in school each week (less than an hour, 1 or 2 hours, etc.)?

c. What did you like **best** about your [ACOT] experiences?

d. What did you like **least** about your [ACOT] experiences?

2. Now let's talk about this year. What kinds of things are you doing with computers in the seventh grade?

(Probe as in Question 1a)

a. How much time do you usually work with the computer in school each week?

b. What do you like **best** about these experiences?

c. What do you like **least**?

3.a. How do you feel about this year's computer experiences compared to last years [ACOT] experiences? Which do you like better? Why?

b.. Is there anything you like better this year (regarding computers)? Why?

c. What do you miss most about last year (regarding computers)? Why?

4. How would you rate your computer skills this year compared to last? Better, worse, about the same?

5. Do you think that it's important for students your age to have a school computer to work with? Why or why not?

   (Probe to identify what skills might be valuable)

Thank you for your answers...

APPENDIX B

STUDENT INTERVIEW SUMMARIES

White State Jr. High (1 ACOT)
Melrose (1 ACOT)
Snowden (1 ACOT)
Total Responses: 3

Question 1: Things learned and done:

Did all of our work on computers
Dazzle Draw
Print Shop
Math (3) MECC Disks and Word Problems
Word-prosessor to type letters
How to use Computer
Keyboarding
Modem tutors left notes on BBS (2)
Pen Pals from Blue Earth
Used it a lot
Took the things we needed to know and emphasized them
Math we did by hand and books. Took some tests in math on computer
Teacher used scantron to grade them

Question 1a: How much time?

All day
4 1/2 hrs. per day
About 4 hours (anytime we had a chance)
Out of 6 hours, probably used it 5

Question 1c: Liked Best:

Liked to type and the work seemed easier because the computer helped us learn more. Talked to tutor a lot and the other kids (modem)
Teachers let us work on our own--to experiment and had more time to do our work
The modem

Question 1d: Liked Least:

Some of the disks weren't as much fun as others (reading ones)
When we had to go to P.E.
If someone didn't understand something on math diskette for example, everyone would have to go back for teaching. Couldn't move on if you knew it. Was in highest group, but if others didn't move, we couldn't. Didn't like PIBS very much--just words.

Question 2: What kinds of things are you doing with computers?

(None of these students had had any experience this year.)

Question 3: How do you feel about this year's experiences compared to last year's?

I think you have more understanding of the material when you have to write, but in Health this year, we write a LOT and it would be useful to have a word-processor for that course.

I liked having the computer. It's more interesting and makes the work easier.

Like last year better.

Question 3b. Is there anything you like better this year?

No. (3)

Would like to have had them (computers)

Question 3c. What do you miss most about last year?

The modem and the mouse

Everything

Some of the fun diskettes we did. Got prizes for some of our work. The attention we got.

Question 4. How would you rate your computer skills this year compared to last?

Better last year because we had a lot of practice. Also had them in 5th grade class.

Worse this year because I've had no practice

A little rusty this year

Question 5. Do you think that it's important for students your age to have a school computer?

Yes. Makes the work easier. Learn more, faster.

Yes. Helps you learn. Makes the work seem easier. It is easier to type than to write by hand.

Sometimes I think yes, and sometimes, no. Yes, because typing on the computer is a break from writing by hand all the time. No, because you become dependent and can't learn from books as well when you aren't used to doing it.

APPENDIX C

RESPONSE FREQUENCY RESULTS FOR PARENT INTERVIEW

1. How would you compare the quality (effectiveness, worth, educational value) of your child's school experience this year with last year?

   1. Grades lower this year: 4
   2. Mentioned usual developmental adjustment problems: 4
   3. Academics tougher in junior high: 3
   4. More instructional time last year with computer: 1
   5. Parent liked computer access last year: 1
   6. Difficulty adjusting from computer back to traditional learning: 1
   7. Computers provided needed challenge last year: 1

2. What do you think your child liked best about school last year? This year?

   Last year
   1. computer: 10
   2. Math: 2
   3. English: 1

   This year
   1. Didn't know: 4
   2. French: 2
   3. Computer: 2
   4. Math: 1
   5. Science: 1
   6. Sports: 1

3. Have you noticed any differences (performance, motivation/interest) in your child's school work this year compared to last year?

   1. More motivation last year/less motivation this year: 4
   2. Grades are lower this year: 3
   3. No differences: 3
   4. Studies harder this year: 2
   5. Learning ability is greater this year: 1

4. How much time do you spend with your child doing homework this year compared to last?

   1. Less this year: 6 (explanations: mother is now in nursing school: 1; mother is now employed and has less time: 1; student's "ability has improved" and needs less help: 1; mother has "other" involvements that require her time this year: 1; parent was more motivated by the computer to help: 1; student is more mature this year and requires less help: 2)

   2. More this year: 2 (explanations: academics are more difficult; student isn't working as hard on his own)

   3. Same: 2

Question 5. How does your child appear to feel about school this year as compared to last year? Explain in terms of amount of work, difficulty, interest, motivation.

1. Likes better this year: 4
2. Academics more difficult this year: 4
3. Like better last year: 2

Question 6. What effect did having the Apple computer in your home last year have on your family?

1. Other family members used: 10
2. Parent(s) used: 10
3. Parent helped with set/up: 9
4. Siblings used; 9
5. Mentioned adults brushing up on typing skills: 3
6. Aunt used: 2

Question 7. Do you think your child will do as well this year in school without the Apple computer at home and at school?

1. Worse without computer: 4
2. As well as: 3
3. Uncertain: 2
4. N/A; sibling in ACOT has computer this year: 1

Question 8. Has your child expressed any future career goals?

1. computer field: 5
2. Teacher: 2
3. None: 2
4. Counselor: 1
5. Psychiatrist: 1

Question 9. What did you like best about the ACOT program last year? Explain.

1. Provided an opportunity they would not have had: 4
2. Hands-on exposure: 4
3. Tutor concept, or bulletin board: 3
4. Motivated student to learn or do homework: 2
5. Parent-orientation class: 1
6. Worked together as a family team: 1
7. ACOT personnel took genuine "interest" in students: 1
8. ACOT personnel interested in parent involvement: 1
9. Children learned problem-solving skills: 1
10. Field trips: 1
11. Keyboarding: 1
12. Many positive aspects; could not single out one: 1

Question 10. What did you like least about the ACOT program last year (i.e., anything they can improve)? Explain.

1. No changes indicated: 7
2. Coordinate computer curriculum to textbook chapters: 1
3. Tied up phone line: 1
4. It only lasted one year and isn't available at East: 1

APPENDIX D

Open-Ended Comments by Teachers for

ACOT and Control Students

TEACHERS' PERCEPTIONS OF ACOT STUDENTS' STRENGTHS AND WEAKNESSES

NOTE: Eng-English teacher: Math-Mathematics teacher: Cmtr-Computer teacher

FALL

Eng	STRENGTH:	None listed.
	WEAKNESS:	St was placed in a level 2 class based on test scores. She is with a class of other students on this same level many of whom are behavioral problems. Both her academic work and conduct are unacceptable. I have talked with her mother on the telephone. She seemed to be cooperative.
Math	STRENGTH:	--
	WEAKNESS:	--

SPRING

No data.

FALL

Eng	STRENGTH:	None.
	WEAKNESS:	Rachel has shown great improvement since entering the class. Both her behavior and her interest in the subject matter have improved. Her self-confidence seems to be a bit low as evidenced by her thumb sucking. However, she is well liked by the other students and has developed adequate social skills.
Math	STRENGTH:	Has general knowledge of basic facts.
	WEAKNESS:	Greater motivation would help.

SPRING

Eng	STRENGTH:	She has natural leadership ability.

		She appears to feel insecure--sucks her thumb continually.
	WEAKNESS:	Complete lack of interest in work or grade.
Math	STRENGTH:	Has the ability to do average work.
	WEAKNESS:	Complete lack of interest in work or grade.

FALL

Eng	STRENGTH:	Is very cooperative.
	WEAKNESS:	Too shy.
Math	STRENGTH:	
	WEAKNESS:	Needs a great deal of individual instruction but will not ask for assistance during class. She gets off to herself during class and seldom participates.

SPRING

Eng	STRENGTH:	
	WEAKNESS:	Very listless: Has refused to do everything she was asked to do.
Math	STRENGTH:	Quiet and cooperative.
	WEAKNESS:	Needs more practice with basic skills.

FALL

Eng	STRENGTH:	Has mastered most of the skills that we have worked on. She has the potential to be a star pupil.
	WEAKNESS:	Her attitude and rudeness present problems for her and the class.
Math	STRENGTH:	--
	WEAKNESS:	--

SPRING

Eng	STRENGTH:	Has ability to be an excellent student.
	WEAKNESS:	Unusually loud and rude.
Math	STRENGTH:	Excellent ability

	WEAKNESS:	Disruptive in class--possibly because she needs a higher level math.
FALL		
Eng	STRENGTH:	Can be creative at times
	WEAKNESS:	Quite playful
Math	STRENGTH:	--
	WEAKNESS:	--
Cmtr	STRENGTH:	--
	WEAKNESS:	Knows what to do in class but he chooses not to do his classwork. He is constantly off-task unless monitored all the time.
SPRING		
Eng	STRENGTH:	Has the ability to do much better.
	WEAKNESS:	Lacks basic social skills.
Math	STRENGTH:	Very capable.
	WEAKNESS:	Sometimes influenced by his peers in conduct for an S rather than E.
Cmtr	STRENGTH:	Can type like the wind!
	WEAKNESS:	Behavior--he cannot seem to control himself in class.
FALL		
Eng	STRENGTH:	Is artistic.
	WEAKNESS:	Prefers to create things with her hands to the abstract thinking which the Eng class requires.
Math	STRENGTH:	Good understanding of the basic skills.
	WEAKNESS:	Very talkative.
SPRING		
Eng	STRENGTH:	The ability to think independently.
	WEAKNESS:	Inability to get along with others. Frequently argues and fights with other students.

Math STRENGTH: Ability to do much better.
WEAKNESS: Easily distracted.

FALL

Eng STRENGTH: --
WEAKNESS: Poor attitude, short attention span, and lack of motivation keep her from achieving.

Math STRENGTH: --
WEAKNESS: --

Cmtr STRENGTH: --
WEAKNESS: Will not stay on task unless constantly monitored. She is disruptive to the whole class.

SPRING

Eng STRENGTH: --
WEAKNESS: Spends a lot of time and energy trying to attract attention. Has a very negative attitude. Lacks basic skills.

Math STRENGTH: Can do the work if she would try.
WEAKNESS: Lack of self control (extreme); lack of motivation; skills are weak.

Cmtr STRENGTH: --
WEAKNESS: Classroom behavior interferes with her work. She is disruptive to the whole class.

FALL

Eng STRENGTH: --
WEAKNESS: Lack of motivation.

Math STRENGTH: --
WEAKNESS: --

SPRING

Eng STRENGTH: Good conduct.
WEAKNESS: Lacks basic skills; Very listless.

Math	STRENGTH:	Ability to be A to B student in level 6 class; however, he did close to nothing all year. I don't think he wanted to be in optional program.
	WEAKNESS:	Appears to just not care.
Cmtr	STRENGTH:	Does will in computer class. Enjoys his work and completes it well.
	WEAKNESS:	Organization. He cannot seem to keep up with his folder. Written work--He does much better at the computer than in writing answers.

FALL

Eng	STRENGTH:	Can do much better than he does.
	WEAKNESS:	Lack of motivation.
Math	STRENGTH:	--
	WEAKNESS:	--
Cmtr	STRENGTH:	--
	WEAKNESS:	--

SPRING

Eng	STRENGTH:	Very cooperative at times.
	WEAKNESS:	Lacks basic skills.
Math	STRENGTH:	Highly motivated and competitive with several other above average students. Wants to make an "A".
	WEAKNESS:	Sometimes influenced by lower conduct group affecting his conduct from an "E" to "S."
Cmtr	STRENGTH:	--
	WEAKNESS:	Organization--Did not keep up with nor turn in his folder. Computer programs were better than his written answers to tests.

FALL

Eng	STRENGTH:	Understanding of grammar is good. His test scores reveal this.
	WEAKNESS:	Easily distracted. Every task takes him much longer to accomplish than

most of the sts. He refuses to do any independent reading. During oral reading periods he looks around and will not follow the printed material in his book. He does no homework and classwork only when I prod him along and give him individual attention.

Math STRENGTH: Listens well but when it comes to responding, has problems.

WEAKNESS: Very slow in basics. His study habits are very weak, which results in making a low score on assignments. Also, he doesn't complete homework assignments.

SPRING

Eng STRENGTH: Gets along well with peers. Is respectful of authority. Oral perception skills appear to be better than visual. He will listen to a story with understanding. Speaking vocabulary is adequate.

WEAKNESS: Has problem with reading and spelling, syllabication and pronunciation. Easily distracted. He does not stay on task; tends to day dream or find other distractions in the classroom. I have seen some improvement in this area this year.

Math STRENGTH: Has good intentions but he doesn't follow through with them.

WEAKNESS: Lacks the good study habits he needs to achieve better grades in school.

FALL

Eng STRENGTH: Student's ability far exceeds his performance.

WEAKNESS: --

Math STRENGTH: Analytical mind; attends class regularly; demonstrated effort to learn; is perceptive; alert;

WEAKNESS: Easily distracted; nosey; tattler; does unauthorized talking; busybody; plays in class.

SPRING

No data.

FALL

Eng	STRENGTH:	Very creative and an excellent student.
	WEAKNESS:	--
Math	STRENGTH:	--
	WEAKNESS:	--
Cmtr	STRENGTH:	--
	WEAKNESS:	Has trouble keeping himself on task.

SPRING

Eng	STRENGTH:	Shows great interest at times; has ability to perform better; very creative at times;
	WEAKNESS:	Easily distracted; Does not follow through on assignments;
Math	STRENGTH:	Pleasant; wants to please.
	WEAKNESS:	Plays in class; not consistent in doing the work; This is a big weakness for him.
Cmtr	STRENGTH:	--
	WEAKNESS:	Has difficulty controlling his behavior in class.

FALL

Eng	STRENGTH:	Very cooperative.
	WEAKNESS:	--
Math	STRENGTH:	--
	WEAKNESS:	--

SPRING

Eng	STRENGTH:	Reads and writes fairly well. Tries hard to achieve. Very cooperative and attentive; has a very pleasant personality.
	WEAKNESS:	Doesn't ask enough questions when she doesn't understand. Sometimes does not follow directions.

Math	STRENGTH:	Motivated to learn; concerned about her work most of the time.
	WEAKNESS:	Has some difficulty mastering new concepts.
Cmtr	STRENGTH:	Organized in her work: Folder is up-to-date and turned in on time.
	WEAKNESS:	Does better on work assigned on the computer (class programs) than she does on written work (tests, quizzes on material covered).

FALL

Eng	STRENGTH:	Has the ability to do better.
	WEAKNESS:	Lack of motivation and short attention span.
Math	STRENGTH:	--
	WEAKNESS:	--
Cmtr	STRENGTH:	--
	WEAKNESS:	More interested in socializing than in completing work assignments.

SPRING

Eng	STRENGTH:	Can do much better.
	WEAKNESS:	Seems to deliberately do wrong.
Math	STRENGTH:	Consistent in trying to keep up.
	WEAKNESS:	Was not ready for level 6. She needed another year of basic math to get caught up on the skills.
Cmtr	STRENGTH:	--
	WEAKNESS:	Not a thinker; she is a rote follower of instructions but cannot seem to extend this to her own work.

FALL

Eng	STRENGTH:	Works hard and has made improvement in her study habits in the past 9 weeks.
	WEAKNESS:	Easily distracted.
Math	STRENGTH:	--
	WEAKNESS:	--

SPRING

Eng	STRENGTH:	Has ability to perform better.
	WEAKNESS:	Easily distracted.
Math	STRENGTH:	Has ability to be a student in Level 6 class.
	WEAKNESS:	Not consistent in work.
Cmtr	STRENGTH:	Does well what she is instructed to do.
	WEAKNESS:	Does not independently create her own work unless she is specifically told to.

FALL

Eng	STRENGTH:	Has the ability to do better.
	WEAKNESS:	Spends a lot of time trying to get out of doing the work for this class.
Math	STRENGTH:	--
	WEAKNESS:	--

SPRING

Eng	STRENGTH:	--
	WEAKNESS:	Poor attendance: Very negative about everything: lacks basic skills.
Math	STRENGTH:	--
	WEAKNESS:	Been in class for a short time. Was failing when transferred to this class. During the time he has been in my class, little effort or interest has been displayed.
Cmtr	STRENGTH:	--
	WEAKNESS:	Behavior interferes with his doing his work. It requires constant effort to keep him on task and to prevent his disturbing others.

FALL

Eng	STRENGTH:	Has very quick mind.
	WEAKNESS:	Attitude gets in the way of her being able to forget resentments and concentrate on her studies.

Math STRENGTH: Average progress to date: Basic operations.

WEAKNESS: Incompletes causing below average work: Is preoccupied with outside social interests.

SPRING

Eng STRENGTH: Has the mental capabilities to achieve.

WEAKNESS: Hostile attitude: easily led: wide swings of emotions. Her mother attributes much of this to her parents' divorce.

Math STRENGTH: Can progress when she makes an effort.

WEAKNESS: Influenced by her peers. Late to class, absences most recently.

FALL

Eng STRENGTH: Has the ability to do the work.

WEAKNESS: Lacking in motivation. She frequently comes to class without her book or materials with which to work. She is very much interested in being the center of attention. Her goals are social rather than academic.

Math STRENGTH: An average student.

WEAKNESS: Needs to be motivated more in order to achieve more.

SPRING

Eng STRENGTH: Desire to achieve. She has made great strides in her skills this year.

WEAKNESS: Poor basic skills (from poor instruction in the past?)--or possibly because of behavior problems which have improved dramatically this year.

Math STRENGTH: Cooperative and completes her assignments.

WEAKNESS: --

FALL

Eng STRENGTH: Has the ability to do better.
WEAKNESS: Very careless in keeping up with her materials.

Math STRENGTH: --
WEAKNESS: --

SPRING

Eng STRENGTH: Has the ability to do better.
WEAKNESS: Doesn't follow through on assignments. She spends quite a bit of time faking and trying to get out of work. She is very disrespectful.

Math STRENGTH: Works well with others. Very friendly.
WEAKNESS: --

Cmtr STRENGTH: --
WEAKNESS: Wants teacher approval on everything before she will continue. She does not want to or cannot determine if her work is correct by herself. She does not listen well to instructions. She has an extremely loud voice.

FALL

Eng STRENGTH: --
WEAKNESS: Has limited skills in English. Does not take an interest in any of his work in my class.

Math STRENGTH: Punctual; good attendance; brings materials; good attitude toward authority.
WEAKNESS: Poor listener; poor use of time; neglects homework; poor posture; unauthorized talking; plays in class; lack of self-esteem; does not value learning mathematics; inattentive; neglects assigned class work.

SPRING

No data.

FALL

Eng	STRENGTH:	Healthy attitude toward classwork and classmates.
	WEAKNESS:	--
Math	STRENGTH:	Good background of basic operations on whole numbers, fractions, decimals. Good reasoning ability.
	WEAKNESS:	Sometimes gets in too much of a hurry--makes careless arithmetic errors.

SPRING

No data.

FALL

Eng	STRENGTH:	--
	WEAKNESS:	--
Math	STRENGTH:	--
	WEAKNESS:	--

SPRING

No data.

FALL

Eng	STRENGTH:	Good listening skills. Ability to follow directions. Good reading skills.
	WEAKNESS:	Writing skills as compared to above listed STRENGTH:s. Writing skills should improve significantly by the end of this school year.
Math	STRENGTH:	--
	WEAKNESS:	--

SPRING

No data.

FALL

Eng	STRENGTH:	--
	WEAKNESS:	Fails to pay attention
Math	STRENGTH:	Once a concept is mastered, it is not hard for her to understand related materials.
	WEAKNESS:	Has short attention span. Therefore, time is allotted for teaching, reteaching, practice and enrichment activities.

SPRING

No data.

TEACHER S PERCEPTIONS OF CONTROL STUDENTS STRENGTHS AND WEAKNESSES

NOTE: Eng-English teacher: Math-Mathematics teachers: Cmtr-Computer teacher

FALL

Eng STRENGTH: Has strength in some aspects of the language.
WEAKNESS: On the other hand, will score below average which hampers the good grades obtained.

Math STRENGTH: Hard worker on a daily basis.
WEAKNESS: No self-set goals. She seems to perceive best when given direct guidance.

SPRING

No data.

FALL

Eng STRENGTH: Occasionally becomes interested in her work and then is a whirlwind of activity.
WEAKNESS: Other times all she wants to do is put her head down on her desk and sleep. Her interest and work habits are erratic.

Math STRENGTH: Above average in her work at this point.
WEAKNESS: Does not readily accept constructive criticism for her conduct: talking and sometimes very loud, indirectly affecting her work.

SPRING

No data.

FALL

Eng STRENGTH: Tries sometimes.
WEAKNESS: His lack of motivation.

Math STRENGTH: --
WEAKNESS: --

SPRING

No data.

FALL

Eng STRENGTH: Has the ability to do well in English.
WEAKNESS: Her attitude and her lack of motivation keep her from achieving.

Math STRENGTH: Basic skills are good enough to allow her to work on 7th grade level.
WEAKNESS: Behavior and laziness. She spends more time trying to find work to copy from another student than in trying to solve the problems herself.

SPRING

No data.

FALL

Eng STRENGTH: --
WEAKNESS: --

Math STRENGTH: The desire to learn math. Her faithfulness in doing practice work--homework. Reasoning ability.
WEAKNESS: Nonmastery of "times tables" and other basic math skillSTRENGTH: i.e. addition facts, renaming in subtraction, dividing by 2 place divisors, etc.

SPRING

No data.

FALL

Eng STRENGTH: An average student.

WEAKNESS: A bit shy (at times) probably because of being overweight.

Math STRENGTH: Attempts to do homework but is weak in problem solving skills. Basic computation skills seem average.

WEAKNESS: Transfer of basic skills to reading problems or problems in which directions may vary is weak.

SPRING

No data.

FALL

Eng STRENGTH: Tries very hard.

WEAKNESS: Short attention span.

Math STRENGTH: --

WEAKNESS: --

SPRING

Eng STRENGTH: Very cooperative and attentive; pleasant personality; writes well.

WEAKNESS: Easily distracted.

Math STRENGTH: Great attitude. Conscientious.

WEAKNESS: Basic skills are weak for level 6 class; Will try up to a certain point, but then quits.

Cmtr STRENGTH: Her cheerful, bubbly presence in class. She works well within her group.

WEAKNESS: Has trouble transferring what she has learned into her own work.

FALL

Eng STRENGTH: Is motivated and becomes extremely upset with poor grades.

WEAKNESS: Craves acceptance and must have the attention of others. He is immature both physically and socially.

Math STRENGTH: --
WEAKNESS: Easily distracted; weak on his multiplication tables; sometimes does not have his textbook.

SPRING

Eng STRENGTH: Wants to succeed.
WEAKNESS: Craving for attention causes him to be a discipline problem. He is physically and emotionally immature.

Math STRENGTH: Can do well when he wants to.
WEAKNESS: Easily influenced by his peers. Sometimes completing his work is secondary to playing; B capability, C production.

FALL

Eng STRENGTH: Wants to make good grades; motivated to do her work.
WEAKNESS: Tendency to demand higher grades than she earns.

Math STRENGTH: One of the top students in the class--advanced.
WEAKNESS: --

SPRING

Eng STRENGTH: Desire for good grades.
WEAKNESS: Tends to overestimate her abilities.

Math STRENGTH: Very capable.
WEAKNESS: Could make higher grades if she made an effort.

FALL

Eng STRENGTH: Has a good mind.
WEAKNESS: Attention span is short; easily distracted; disposition is volatile.

She angers easily and frequently argues with the other students.

Math STRENGTH: Makes a good attempt to complete assignments.
WEAKNESS: Makes a number of errors when working but is able to correct them when brought to her attention.

SPRING

No data.

FALL

Eng STRENGTH: --
WEAKNESS: Is too playful.

Math STRENGTH: Fair knowledge of basic skills.
WEAKNESS: Allows his behavior to interfere with his achievement.

SPRING

Eng STRENGTH: --
WEAKNESS: Lacks basic skills: very disrespectful.

Math STRENGTH: Capable of making average progress.
WEAKNESS: Very immature.

FALL

Eng STRENGTH: --
WEAKNESS: --

Math STRENGTH: Appears to understand readily and responds well in class.

WEAKNESS: Slow about getting to class.

SPRING

Eng STRENGTH: Very cooperative: tries to achieve.
WEAKNESS: Listless at times.

Math STRENGTH: Cooperative.
WEAKNESS: Works quite slowly.

FALL

Eng STRENGTH: Has the ability to do better.
WEAKNESS: Wants to play too much at times.

Math STRENGTH: --
WEAKNESS: --

SPRING

Eng STRENGTH: Has the ability to achieve more: very good attitude: reads fairly well.
WEAKNESS: Attention span is too short: is easily influenced by others.

Math STRENGTH: Pleasant attitude in class.
WEAKNESS: Doesn't consistently come to school: overall skills are weak.

FALL

Eng STRENGTH: Very grade conscious and wants to do well.
WEAKNESS: Attitude needs some work.

Math STRENGTH: Good understanding of the basic skills. She can be depended on to complete her assignments.

SPRING

Eng STRENGTH: Desire for good grades.
WEAKNESS: Attitude problem.

Math STRENGTH: Cooperative: completes her assignments.

FALL

Eng STRENGTH: Has the ability to do better.
WEAKNESS: Lack of interest and motivation hinders her achievement.

Math STRENGTH: Flighty. Some days excellent progress, others unsatisfactory. Overall average or slightly above.

WEAKNESS: Readily distracted by her group (clique). Sometimes does not have her book.

SPRING

Eng STRENGTH: Has the ability to do well. She has mastered most of the basic skills.
WEAKNESS: Negative attitude hinders her progress.

Math STRENGTH: Seems to have a good foundation in math and quick to understand new principles, but does not seem motivated to do above average work.
WEAKNESS: Easily influenced by her peers. Social life first, math second.

FALL

Eng STRENGTH: Can do better.
WEAKNESS: Has a very poor attitude.

Math STRENGTH: --
WEAKNESS: Lacking in basic skills and motivation.

SPRING

Eng STRENGTH: Has the ability to do better.
WEAKNESS: Negative attitude keeps her from progressing.

Math STRENGTH: --
WEAKNESS: Poorly motivated. She will not make an effort to complete her assignments.

FALL

Eng STRENGTH: Does well those things which interest her.
WEAKNESS: Omits those things which don't interest her.

Math STRENGTH: --
WEAKNESS: --

SPRING

Eng STRENGTH: --
WEAKNESS: --

Math STRENGTH: Progresses when she tries.
WEAKNESS: Motivation varies. Sometimes do not know if she doesn't understand the problem or is just not motivated to do the work.

FALL

Eng STRENGTH: Seems to be quite interested at times.
WEAKNESS: His attention span is too short at times.

Math STRENGTH: --
WEAKNESS: --

SPRING

Eng STRENGTH: Speaks well; very attentive and cooperative at times; interested in a variety of subjects; can read and write fairly well.
WEAKNESS: Easily influenced by others who are not performing well.

Math STRENGTH: Should have been in level 6 math class, because he is motivated and catches on so quickly. He needed more of a challenge.
WEAKNESS: Immature behavior in classroom.

FALL

Eng STRENGTH: Has the ability to do better.
WEAKNESS: Has a very short attention span.

Math STRENGTH: --
WEAKNESS: --

SPRING

Eng STRENGTH: Can be very cooperative at times.
WEAKNESS: Lacks basic social skills; refuses to follow directions.

Math STRENGTH: She tries.

WEAKNESS: Is slow to master concepts; recall is minimum.

FALL

Eng STRENGTH: --
WEAKNESS: Seems to have emotional problems.

Math STRENGTH: He will try until he becomes frustrated.
WEAKNESS: Is able to work on the 3rd grade level. Beyond that he is lacking in enough of the basic skills to be successful.

SPRING

Eng STRENGTH: Is very nice when he is in a good mood. He is very neat and likes his assignments to be very neat.
WEAKNESS: Has mood swings. When he's in a bad mood, his behavior in class is very difficult to manage. He has what seems to be a visual perception problem. He has great difficulty writing. He's neat but extremely slow. His mother informed me that he wears glasses but looses them almost as soon as she buys them. She's in the process of getting him contacts in hopes that he will wear them.

Math STRENGTH: Tries.
WEAKNESS: Has difficulty understanding and working independently. At times he is given work on a level lower than the majority because he becomes confused.

FALL

Eng STRENGTH: Very friendly.
WEAKNESS: Poor ability and poor self esteem.

Math STRENGTH: --
WEAKNESS: --

SPRING

Eng STRENGTH: --
WEAKNESS: Lacks basic skills: very short attention span: very disrespectful.

Math STRENGTH: Sweet personality.
WEAKNESS: No self control: zero attention span: behind in basic skills: hyperactive: seeks attention which is disruptive to class.

FALL

Eng STRENGTH: --
WEAKNESS: Never brings book. Does not participate. Talks and acts up continually.

Math STRENGTH: None. Generally determined by his attitude and conduct. Wants to play: easily influenced.
WEAKNESS: Easily distracted by outside interests. Weak in some operations --multiplication and division.

SPRING

Eng STRENGTH: --
WEAKNESS: Seems to be mentally and emotionally removed. His only interest appears to be in art. He refuses to participate or even to complete tests. He may begin, but he always seeks refuge in drawing.

Math STRENGTH: Does not generally interrupt others trying to study. Seems to understand the basics.
WEAKNESS: Does not apply himself to his studies or complete his daily assigned work. Will not do some of his classwork. Would rather draw or play some made up game.

FALL

Eng STRENGTH: --
WEAKNESS: Poor conduct prevents her from being able to concentrate on the instruction

in the classroom. Her behavior also limits her ability to work independently. She has the ability to do the work if she can get over her inordinate desire for attention.

Math STRENGTH: --
WEAKNESS: Poorly motivated and constantly complaining.

SPRING

Eng STRENGTH: --
WEAKNESS: Behavior problems prevent this student from achieving academically.

Math STRENGTH: Is pleasant.
WEAKNESS: Short attention span.

FALL

Eng STRENGTH: Seems to be very creative.
WEAKNESS: Poor attitude keeps him from performing well.

Math STRENGTH: --
WEAKNESS: --

SPRING

Eng STRENGTH: Has the ability to be an excellent student; Can read and follow directions well; can be creative at times.
WEAKNESS: Lacks basic social skills.

Math STRENGTH: Loves to achieve and strives to do so.
WEAKNESS: Acts childish; pouts; slams books around; throws mini-tantrums; is easily distracted.

FALL

Eng STRENGTH: Has the ability to do better.
WEAKNESS: Lack of motivation.

Math STRENGTH: --
WEAKNESS: Has been in my class only 3 times. Was completely lost during that time.

Eng	STRENGTH:	Has the ability to achieve more.
	WEAKNESS:	Very negative. He strives to do just the opposite of what he is asked to do.
Math	STRENGTH:	Is quiet.
	WEAKNESS:	Lack of basic skills needed to work on 7th grade level.

FALL

Eng	STRENGTH:	Has the ability to perform better than she does.
	WEAKNESS:	Lacks motivation and interest.
Math	STRENGTH:	Seems to know basic operations: excellent on some assignments.
	WEAKNESS:	May misread the question and work a set of problems incorrectly.

SPRING

Eng	STRENGTH:	Cooperative at times: has ability to perform well.
	WEAKNESS:	Easily distracted.
Math	STRENGTH:	Can progress when she tries.
	WEAKNESS:	Will consult other students sometimes on her assignment. Getting the answer rather than understanding the problem.

FALL

Eng	STRENGTH:	Has a wonderful attitude which is exhibited in a very positive manner to her teacher and peers.
	WEAKNESS:	Has a visual perception problem that causes her to have problems reading, writing and copying assignments from the board or the textbook. She is not an aggressive young lady in my classroom, but most of the other girls are and they have made her cry by teasing her.
Math	STRENGTH:	Will continue to attempt to complete assignment.

WEAKNESS: Complains: lack of self-confidence: forgets to bring work back: does not bring book: talks.

SPRING

Eng STRENGTH: Is a wonderful student. Is cooperative, honest, and basically in good spirits each day. She tries hard to achieve the best.

WEAKNESS: Has a learning disability. A visual perceptual problem causes her problems in comprehension as well as writing assignments from the board or the textbook.

Math STRENGTH: Interested: usually tries to understand assignments.

WEAKNESS: Lacking in self-confidence: likes constant reinforcement: does not need so much help. Enjoys being involved with teacher. Likes to write on board and "play teacher." I would like to try her in Math 8 with consultation. Her mother wants her to stay in resource.

FALL

Eng STRENGTH: Has the ability to do better.

WEAKNESS: Too playful.

Math STRENGTH: Stays with her work until complete.

WEAKNESS: Some multiplication and division problems.

SPRING

Eng STRENGTH: Very cooperative: pleasant attitude.

WEAKNESS: Short attention span: lacks some basic skills.

Math STRENGTH: Is preoccupied more with social life than classwork, but when forced, responds in an above average manner.

WEAKNESS: Easily distracted by her peers.

FALL

Eng STRENGTH: --
WEAKNESS: --

Math STRENGTH: Has a general understanding of basic skills.

SPRING

No data.